STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:		
APPLICATION OF EOG RESOURCES, INC., FOR APPROVAL OF A PILOT WATERFLOOD PROJECT IN THE NORTH RED HILLS UNIT, LEA COUNTY, NEW MEXICO	CASE NOS.	12,399 and
APPLICATION OF EOG RESOURCES, INC., FOR A UNIT AGREEMENT, LEA COUNTY, NEW MEXICO		12,329
		(Consolidated)

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: MICHAEL E. STOGNER, Hearing Examiner

May 18th, 2000

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, MICHAEL E. STOGNER, Hearing Examiner, on Thursday, May 18th, 2000, at the New Mexico Energy, Minerals and Natural Resources Department, Porter Hall, 2040 South Pacheco, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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I N D E X

May 18th, 2000
Examiner Hearing
CASE NOS. 12,399 and 12,329 (Consolidated)

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A P P E A R A N C E S

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* * *

WHEREUPON, the following proceedings were had at 8:17 a.m.:

EXAMINER STOGNER: At this time I will call this hearing to order, Docket Number 13-00. Please note today's date, Thursday, May 18th. I'm Michael Stogner, appointed Hearing Examiner, for today's cases.

At this time I will Call Case Number 12,399.

MS. HEBERT: Application of EOG Resources, Inc., for approval of a pilot waterflood project in the North Red Hills Unit, Lea County, New Mexico.

EXAMINER STOGNER: At this time i'll call for appearances.

MR. CARR: May it please the Examiner, my name is William F. Carr with the Santa Fe law firm Campbell, Carr, Berge and Sheridan. We represent EOG Resources in this matter.

I would also request at this time, Mr. Examiner, that you call the following case, Case 12,329, which is also an Application of EOG for approval of a unit agreement, and we'd request that the cases be consolidated for the purpose of the hearing.

EXAMINER STOGNER: Are there any other appearances in Case 12,399?

At this time I'll call Case Number 12,329.

MS. HEBERT: Application of EOG Resources, Inc.,

for a unit agreement, Lea County, New Mexico.

MR. CARR: May it please the Examiner, I have two witnesses who need to be sworn.

EXAMINER STOGNER: Okay, these two cases will be consolidated for purposes of testimony.

Will the witnesses please stand to be sworn at this time?

(Thereupon, the witnesses were sworn.)

MR. CARR: At this time, Mr. Stogner, we would call Larry D. Cunningham.

EXAMINER STOGNER: Mr. Carr?

LARRY D. CUNNINGHAM,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. CARR:

Q. Would you state your full name for the record, please?

A. Larry Don Cunningham.

Q. Mr. Cunningham, where do you reside?

A. Midland, Texas.

Q. By whom are you employed?

A. EOG Resources, Inc.

Q. Have you previously testified before this Division?

A. Yes, I have, it's been a number of years.

Q. Would you summarize your educational background for Mr. Stogner?

A. I have a BBA in finance and real estate from the University of North Texas in 1978.

Q. And since graduation, for whom have you worked?

A. Two years with Texaco, 17 years with Mitchell Energy Corporation, and three years with EOG Resources.

Q. And at all times have you been employed as a petroleum landman?

A. Yes, sir, I have.

Q. Are you familiar with the Applications filed in these consolidated cases?

A. Yes, sir, I am.

Q. Are you familiar with the status of the lands involved in the proposed North Red Hills Unit area?

A. Yes, sir, I am.

Q. Are you familiar with EOG Resources' efforts to reach voluntary agreement with other interest owners in the unit area for the further development of these lands?

A. Yes, sir, I am.

Q. And are you also familiar with the proposed unit agreement and the unit operating agreement and the status of the ratification of these agreements and this unit plan?

A. Yes, sir, I am.

MR. CARR: We tender Mr. Cunningham as an expert witness in petroleum land matters.

EXAMINER STOGNER: Mr. Cunningham is so qualified.

Q. (By Mr. Carr) Would you briefly summarize for Mr. Stogner what it is that EOG seeks in these cases?

A. EOG seeks the voluntary unitization of the proposed North Red Hills Unit area, comprised of 3555.81 acres of state and federal lands, and also the approval of a pilot waterflood project for said unit.

Q. Mr. Cunningham, what is the status of the acreage in the proposed unit area?

A. There are ten tracts, one state tract and nine federal tracts.

Q. Would you refer to what has been marked for identification as EOG Exhibit Number 1, identify this and review it for Mr. Stogner?

A. Exhibit Number 1 is a photocopy of a Midland Map Company map, which outlines the unit acreage and the adjacent acreage. The unit is outlined in red and comprises all or parts of eight sections.

Q. Let's go to Exhibit Number 2. Would you identify this, please?

A. Exhibit Number 2 is the Exhibit "A" and "B" from the unit agreement. The first part of Exhibit Number 2 is

the ownership schedule setting out the tracts and their ownership by lessor, lessee, overriding royalty owner and working interest.

The second part of Exhibit 2 is a plat which is Exhibit "A" to the unit agreement, which outlines the unit and designates the tracts for the unit.

Q. Each of the tracts in the first part of this exhibit are numbered, and then those numbers correspond to the numbers within the unit boundary on the plat; is that right?

A. Yes, they do.

Q. What percentage of the land in the unit area is federal land?

A. The federal acreage covers 3475.81 acres, which is 97.75 percent.

Q. And the state land is the remainder of the acreage?

A. 80 acres, which is 2.25 percent of the unit outline.

Q. Would you identify EOG Exhibit Number 3?

A. Exhibit Number 3 is the unit agreement. It is a standard state/federal form, revised in January of 1992. It's a typical form, state waterflood, state/federal/fee, shows the character of the lands, provides for waterflooding, sets out the basis for participation of each

of the parties.

And I would like to note at this point that in the original unit agreement there was a typo on page 6, in the formula for participation. A description of the definition of B for that formula was incorrect. It showed what was in the standard form, which was total cumulative production. Instead it should show and has been corrected to show that that item is net porosity acre feet.

Q. Now, when you correct this, are you in any way changing the percentage of unit production that will be allocated to any interest owner in the unit area?

A. No, we are not. The formula was prepared, and the numbers still correspond. It was just a typo.

Q. So this is just a typographical error?

A. That is correct.

Q. Does this unit agreement provide for periodic filing of plans of development?

A. Yes, it does.

Q. And will EOG file these plans of development with the Oil Conservation Division at the same time it files with other government agencies?

A. Yes, we will.

Q. Attached to Exhibit 3 are copies of the ratifications of this agreement which you have obtained to date; is that correct?

A. Yes.

Q. Would you identify what has been marked as EOG Exhibit Number 4?

A. Exhibit Number 4 Is the unit operating agreement. It is on a 1982 AAPL form, 610.

Q. And basically what does this agreement provide?

A. It provides for and outline supervision and management of the unit, defines the rights and duties of all parties, names EOG Resources, Inc., as operator, shows how investment and cost are to be shared, and establishes the voting procedures for decisions to be made by the working interest owners.

It also contains the COPAS setting forth the accounting procedures, showing how costs will be allocated and paid. It contains several standard energy provisions, and there are no major amendments.

Q. Has EOG reviewed the unit plan and these agreements with the Bureau of Land Management?

A. Yes, we have.

Q. And what is the status of the approval process at the BLM?

A. At this point we have a preliminary approval from the BLM.

Q. Would you identify Exhibit 4A?

A. 4A is a faxed memo from Les Babyak, with the

Roswell BLM office, setting forth his recommendation that the unit be approved and designating it as a logical unit for exploratory and secondary development.

Q. And you have requested the final letter designating the unit area from the BLM?

A. Yes, we have.

Q. And that has not yet been received?

A. That has not yet been received.

Q. You, in fact, expect -- hope to have it today but expect to receive it in the next few days?

A. That is correct.

Q. Will that be submitted to the OCD?

A. It will be submitted immediately.

Q. But this is the internal memo that is the recommendation for approval internally?

A. That's correct, the preliminary approval.

Q. Have you reviewed this proposed unit with the State Land Office?

A. Not personally. The contact with the State Land Office has been conducted through our legal counsel, Bill Carr.

Q. And are you aware of what response we have received from the State Land Office?

A. We're not aware of any objections. And as a matter of fact, we changed the unit form agreement at the

request or demand of the State Land Office to use the waterflood unit agreement form.

MR. CARR: Mr. Examiner, we originally proposed the unit on a state exploratory form, but because the long-term plans for the unit, which we will review with you later, provide for waterflooding, the Land Office required that we use the waterflood form. The form has been changed. They have 2.3 percent of the interest in the unit area, and we are expecting the letter from them as soon as the BLM approval is obtained, and so that will also be submitted to you on receipt.

Q. (By Mr. Carr) Mr. Cunningham, what percentage of the working interest ownership in the unit area is voluntarily committed?

A. 100 percent of the working interest.

Q. And the ratifications showing that you have 100 percent of the working interest are attached?

A. Are contained in the unit agreement, yes.

Q. What percent of the royalty interest would be committed to the unit?

A. Once we have a final approval of the State Land Office and the BLM we will have 100 percent of all base royalty committed to the unit.

Q. And what percent of the overriding royalty interest do you now have?

A. At his date we have 100 percent of the overriding royalty interest approval.

Q. So at this point in time we have a 100-percent voluntary commitment to this unit plan?

A. Yes, sir.

Q. And we're here today because the State Land Office approval, they've indicated, would require an approval order from the Division?

A. Yes, that's correct.

Q. Could you identify what has been marked as EOG Exhibit Number 5?

A. Yes, this is the affidavit from Campbell, Carr, Berge and Sheridan, confirming notice of this hearing has been given, required by OCD rules and regulations.

Q. If we look at this affidavit, the only party notified is the Bureau of Land Management; is that correct?

A. That is correct.

Q. As to the unit portion of the case, with 100-percent voluntary commitment, there was no one to notify; is that right?

A. There was no requirement for notification.

Q. This notification and this affidavit addresses the pilot waterflood portion of the case; is that right?

A. That is correct.

Q. Is EOG the only leasehold operator within the

area of review for the proposed pilot injection well?

A. Yes, that is correct.

Q. And so this notice is provided in accordance to rules to notify the owner of the surface of the land?

A. That's correct, which is the BLM.

Q. Were Exhibits 1 through 5 either prepared by you or compiled under your direction and supervision?

A. Yes, sir.

MR. CARR: At this time, Mr. Stogner, we would move the admission into evidence of EOG Resources, Inc., Exhibits 1 through 5.

EXAMINER STOGNER: Exhibits 1 through 5 will be admitted.

MR. CARR: That concludes my direct examination of Mr. Cunningham.

EXAMINATION

BY EXAMINER STOGNER:

Q. Mr. Cunningham, referring to Exhibit Number 2, who was the last overriding royalty to ratify?

A. It was A.G. Andrikopoulos, J.K. Andrikopoulos and Dorothy Tucker Trust.

Q. And when did you get their ratifications?

A. Those ratifications were received on Tuesday.

Q. Tuesday, that would have been what, the 16th?

A. The 16th.

Q. Okay, let's take a look at the state trust lands in this area here. Is that just an 80-acre tract that's over there in what, Section 7?

A. Seven, yes, sir.

Q. Now, initially where would the location of the water injection wells be from this state land?

A. They will be to the southwest, approximately about, oh, a mile, a mile and a quarter.

Q. Okay. Have you had more than one meeting with the State Land Office on this matter?

MR. CARR: Mr. Stogner, I've done that part of it. I can tell you, I have met with the Land Office on two occasions concerning this, once when they contacted us that they wanted the form changed, and once subsequent to that time, I met with Mr. Martinez who agreed that the form we were using was appropriate for the unit.

Q. (By Examiner Stogner) Now, you had mentioned something, Mr. Cunningham, on the unit agreement, a typo?

A. Yes, sir.

Q. Has that document been prepared and distributed to both the Land Office and the BLM?

A. Yes, sir.

EXAMINER STOGNER: Mr. Carr, could you see that I get a copy of at least that page, so I can --

MR. CARR: Yes, sir.

EXAMINER STOGNER: -- insert it in here?

MR. CARR: Yes, sir, we will.

Q. (By Examiner Stogner) Okay. Now, the operating agreement, does this contain what the State Land Office wanted you to change, or the formula, or whatever it was they had you --

A. The unit operating agreement, the State Land Office had no requirements on. It was on the unit agreement. We originally started out using an exploratory unit agreement form, and at their request we changed that to a state/federal/fee waterflood unit agreement form.

Q. Okay, and that's what you have -- other than the typo, that's what you have submitted as Exhibit Number 3; is that correct?

A. Yes, sir.

Q. On page number 2 of your unit agreement, the unitized formation, am I reading this correct that only a portion of the Bone Springs is to be unitized?

A. Yes, sir, it's the third Bone Springs sand, from the top of that sand to the bottom of that sand.

Q. And that is a portion of what I understand is the Red Hills-Bone Spring Pool?

A. I believe that's correct.

MR. CARR: Yes, that's right.

Q. (By Examiner Stogner) You're aware that that

unitized formation is still going to tie up the remainder of that pool and that that will not be subleased?

A. Correct.

Q. Okay, good. Or I should say sub-operated, I should say.

When did you commence putting this unit together for this purpose?

A. We originally started approximately in December of 1999 and January of 2000. We started out using the exploratory unit form and trying to go that route.

Q. And that's when you began to contact the overriding royalties and the working interests?

A. Yes, sir. The original contact was with the BLM and the State Land Office, to gain their input and approval on what we were attempting to do. Subsequent to that, then, we followed through with gaining the approval of the overriding royalty owner.

Q. How about the lease expirations, which -- Do you have the earliest lease expiration date that's affected by this pool?

A. All the tracts within this unit are HBP.

Q. HBP.

A. Held by production.

EXAMINER STOGNER: Okay. Okay, any other questions of this witness?

MR. CARR: I have no further questions of this witness.

EXAMINER STOGNER: You may be excused.

Mr. Carr?

MR. CARR: Mr. Stogner, at this time we would call Randy Cate.

RANDALL S. CATE,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. CARR:

Q. Mr. Cate, would you state your full name for the record, please?

A. Yes, it's Randall Cate.

Q. Where do you reside?

A. In Midland, Texas.

Q. By whom are you employed?

A. I'm employed by EOG Resources, Inc.

Q. And what is your position with EOG Resources?

A. I'm a project reservoir engineer.

Q. Mr. Cate, have you previously testified before this Division?

A. Yes, I have.

Q. At the time of that testimony, were your credentials as an expert in reservoir engineering accepted

and made a matter of record?

A. Yes, they were.

Q. Are you familiar with the Application filed in these consolidated cases?

A. Yes.

Q. And have you made an engineering study of the portion of the Red Hills-Bone Spring Pool which is involved in this case?

A. Yes, I have.

MR. CARR: Are the witness's qualifications acceptable?

EXAMINER STOGNER: They are.

Q. (By Mr. Carr) Mr. Cate, have you prepared exhibits for presentation here?

A. Yes, I have.

Q. Let's go to what has been marked as Exhibit Number 6, and I'd ask you to identify this and review it for Mr. Stogner.

A. Exhibit Number 6 is the Red Hills-Bone Spring Field structure map. The proposed Red Hills North Unit outline is the dashed black line.

Primarily, the structure out here is gently dipping about 50 to 100 feet per mile in a north-to-south regional, and to date there has not been a water leg found in the southern portion or the most downdip region here.

And when we go to the isopach I'll show you that primarily the reservoir quality degenerates, and that's what defines the limits of the field.

Also in blue is the two cross-section traces, one going through the field west to east and one generally in a north to south.

Q. Let's go to the isopach map, Exhibit Number 7. Would you review this for Mr. Stogner?

A. Exhibit Number 7 is a net sand isopach with a density cutoff of 12 percent. Again, the proposed Red Hills North Unit outline is in the dashed black. All the oil wells -- there are 39 of them, producers -- are the black dots within the unit outline.

The red lines are the proposed horizontal wells that we will drill as the first part of this unitized project. And the one in the center there, called the Hallwood "12" Federal 11 is our first horizontal well to be drilled.

Q. And the horizontal drilling program is a subsequent plan that EOG has for this unit, that is after you go in and recomplete the injection well which is the subject of today's hearing; is that correct?

A. Yes.

Q. Could you identify for Mr. Stogner the location of the proposed injector?

A. The proposed injector would be converted producer Vaca "13" Number 2, which is in the extreme southwest section of the unit, and Well Number 2 is approximately 1980 feet from the east line and 660 from the north line of Section 13.

Q. Why was this well selected as the candidate for the initial pilot injector well?

A. As can be seen -- Well, this portion of the field was the initial discovery area, and we initially drilled these wells on 40-acre spacing. The subsequent reservoir data showed that 80 acres was more appropriate, and we did come in, of course, and get the field rules to reflect that. So this 40-acre spacing will allow us to monitor the response of the flood much more quickly.

Q. Are you ready to go to the cross-section?

A. Yes, sir.

Q. Cross-section A-A'? Take that out, please, the west-east cross-section.

A. This cross-section is west to east, and it shows what I alluded to earlier, that if you start on the well to the left, which is the Bell Lake 11 Federal Number 1, the third Bone Spring interval is present, but it has no pay, and it is silty, carbonaceous and very shaly. And of course that well is outside the reservoir limits.

The second well from the left, the Hallwood 12

Federal Number 9, which is a decent producer and within the limits of the field, as can be seen on the curve to the left -- I'm sorry, the curve to the right is a cross-plot density neutron that is shaded in, and that scale is what we typically use on our field logs with a scale of minus 10 porosity at the right to 30.

The one at the middle is a computer-processed porosity which is -- density and neutrons are corrected. And we use that for our Eclipse simulation, but to pick our productive limits of the field we use the typical log, and we have chosen a crossplot porosity of 12 percent. Net sand is also picked on crossover.

But the main thing in these cross-sections is to indicate the outer -- When you're outside the productive limits of the field, there is no -- or virtually no crossplot porosity showing up.

Now, within the field the third well from the left is the Hallwood 12 Federal Number 6, which is indicated in the unit agreement as the well that defines the third Bone Springs sand interval. And as can be seen, the total sand thickness is approximately 140 feet at that point.

The far well to the right, once again, the Diamond 8 Federal Number 2, which was drilled as a dry hole, and again the porosity log shows no crossover, no

indicated net pay at all.

Q. All right, let's go to your cross-section B-B', the north-south cross-section. Again, the trace is shown on the structure map --

A. On the structure map the traces are shown, and --

Q. -- and if you would review this for the Examiner?

A. I pretty much went and built this cross-section just to show the limits of the field. I stayed on the north limits to show that the Diamond 36 Number 2 has no effective pay. That's the well to the far north of the cross-section.

The well, the Hallwood 1 Number 1, also has no effective net sand. That's the well second from the left, and it's in the very north portion of the unit. Now, it's included within the unit boundary, because the proration unit of the Hallwood 1 Number 7, which is the well just due south, is a producer. And that's why that Number 1 is included. But it does help establish the productive limits of the field.

The Diamond 6 Number 1 is also a well that has no effective pay in it. That's the third one from the left, and we're starting to move toward the east, the northeast of the field.

I then drop down through the middle of the field, and as can be seen there is net pay showing on the next two

logs, the Half 6 Number 1 and the Red Hills 7 Number 1.

And then again to two of the edge wells that were completed but very poor producers, the Half 8 Federal Number 1, which is two from the right, and the Javelina 17, which is the last well to the right. Very poor edge producers, as can be seen by the logs. They have little or no effective net pay.

Q. Mr. Cate, are the proposed unit boundaries reasonable and appropriate?

A. Yes, we through our drilling program out here have reasonably defined the limits of the field.

Q. In your opinion, is this an area that can logically be developed under a unit plan?

A. Yes.

Q. I'd like you at this time to refer to what has been marked as EOG Exhibit Number 10, entitled Red Hills Proposed Unit Status and Planned Activity. I think it would be useful if you could review the information on this exhibit and at the same time summarize for Mr. Stogner EOG's plans for the long-term development of this reservoir.

A. Yes, I prepared this simply as a kind of a summary of the status and planned activity for this unit. Under the status, we do have 39 producers in this field. Cumulative production through May, 2000, is 5.5 million

barrels of oil and 8 BCF of gas. Current producing rate for the field is almost 1600 barrels per day.

The primary EUR predicted by decline -- and we've got a reservoir simulator, Eclipse model, that we use to do our predictions, and the EUR on primary production should approach 12.7 million barrels.

The current average bottomhole pressure is 5100 pounds. Now, under the reservoir parameters the original bottomhole pressure was 9500 pounds. The bubble-point pressure, as determined by PVT analysis, is 3844 pounds. We are still -- The reservoir is still above the bubble point, and will be for approximately another three years.

We plan to have a five- to seven-well horizontal program. Again, those were outlined in red on the net sand thickness isopach, which was Exhibit Number 7. And these wells will -- are predicted to increase our primary ultimate recovery by about a half a million barrels and quite a bit of gas, due to lowering the abandonment pressure of the reservoir. But there is approximately 86 million barrels of oil in place, and in order to get that oil out, we will need to do a secondary recovery process and possibly a tertiary recovery. So we have modeled that in our Eclipse simulation. And the predicted recovery, or incremental recovery, from a secondary water injection is approximately 10 million barrels.

So our plan would be to drill these horizontal laterals and then most likely convert those laterals and some of the vertical wells and go to a full-scale waterflood. But initially we will start our pilot project and collect the necessary data in this Vaca 13 Number 2 that we have applied for. And we are studying gas injection.

The reservoir is very tight -- it's approximately .2 millidarcies -- and so there will be some technical challenges. But again with that much oil still in place, it's a project that needs to be done.

Q. So those are your long-term plans?

A. Those are the long-term plans.

Q. Today we're here to hopefully obtain unit approval and approval of a pilot waterflood project?

A. That's right.

Q. Let's go to the pilot waterflood project, and I'd ask you to refer to what has been marked as EOG Exhibit 11 and identify that for the Examiner.

A. Yes, Exhibit 11 is the C-108, Application for Authorization to Inject in the Vaca 13 Federal Number 2 well.

Q. And this is not an expansion of an existing project, correct?

A. That's correct, this will be the initial well in

the pilot area.

Q. Now, Mr. Cate, we've numbered the pages in this exhibit. Would you turn to page 4, identify that, and explain to Mr. Stogner what this shows?

A. Yes, page 4 shows the two-mile radius of investigation of all the wells that are shown, and then the area of review, the smaller circle, half-mile circle, around the Vaca 13 Federal Number 2 that will be converted to injection.

Q. And what is the status of that well at this time?

A. It's currently a producer, approximately 25 barrels per day of oil.

Q. Could you identify what is set forth on pages 5 through 11 of this exhibit?

A. Yes, pages 5 through 11 are wellbore schematics of the wells within the area of review. They show the surface and intermediate casing strings, the cement -- amount of cement that was circulated, the current producing perforations and the tubulars that are used to produce the zone.

Q. Is all the data required by OCD Form C-108 set forth on these well-data sheets?

A. Yes, it is.

Q. What is Exhibit 12?

A. Exhibit 12 is a supplement that is in tabular

form for the same data that was just shown on the schematics, but it gives it out in a little easier form for each of the wells within the area of review.

Q. Let's go to page 6 of Exhibit 11, the schematic on the injection well. Would you review the information on this well for the Examiner?

A. Yes. This well has got the surface casing set down to 657 feet. We circulated 52 sacks of cement to the pit. The 8-5/8 intermediate casing was set at 5035 feet, through the salt section out there, and again circulated cement to the pits. The third Bone Springs sand interval that is perforated and producing currently is at 12,240 feet to 12,264 feet.

These wells were stimulated with a fracture treatment initially. Currently, the well has 2-7/8-inch tubing in there. We will convert that to plastic coating when we use it for injection.

Q. Will the annular space be filled with a fluid and equipped with a pressure gauge at the surface, as required by the Federal Underground Injection Program?

A. Yes, it will.

Q. Are there any other oil-production zones in the immediate area?

A. No, there are not.

Q. And what is the source of the water that you will

be injecting in this well?

A. The source of the water in this pilot project will be produced water from the third Bone Springs sand, from the other 38 remaining producers, and it averages 200 to 300 barrels per day at this point.

Q. And so you're going to just be reinjecting back into the formation water from the same zone --

A. That's correct.

Q. -- as the injection interval?

A. That's right.

Q. What volumes to you propose to inject?

A. We believe that 200 barrels per day would be the initial volume.

Q. And would be your maximum injection rate?

A. Up to 500 barrels per day.

Q. And this will be a closed system?

A. Yes.

Q. Do you propose to inject under pressure?

A. Yes, we do.

Q. And what pressures do you propose to use?

A. The average injection pressure should approximate 3000 pounds, with a maximum up to 3700 pounds.

Q. Now, this pressure limitation exceeds .2 pound per foot of depth, the top of the injection interval, does it not?

A. Yes, it does.

Q. Why are you recommending these pressures?

A. The original bottomhole pressure of this reservoir, it is an overpressured reservoir of 9500 pounds. Back-calculating to an injection pressure just equivalent to the original bottomhole pressure gives us the 3700-pound maximum injection pressure that we're asking for, and we would most likely run it around the 3000 pounds, though. But again, it's only injecting half what its original pressure was.

Q. Mr. Cate, if you were approved to inject at .2 pound per foot of depth, would EOG be willing to go out and establish that you can inject at the higher pressures by a witnessed step-rate test?

A. Oh, yes, if that's necessary, we would do that.

Q. Let's go to what has been marked as Exhibit Number 13. Will you identify and explain this exhibit, please?

A. Exhibit Number 13 is -- It covers portion 11 of the C-108. Initially, when we looked for freshwater wells within a one-mile radius of the injection well, we didn't find any. I had one of our engineering techs do the research, and he called the State Office Engineers, and we didn't indicate a freshwater well at the time.

Subsequent to that, we continued our internal

review and found that our drilling department had a freshwater well. It's in the northeast quarter of the northwest -- of the northwest quarter of Section 13, so it's approximately -- It's just less than half a mile due west of the Vaca 13 Number 2. And we also are attaching a water analysis along with that.

Q. Have you examined the available geologic and engineering data on this reservoir and found as a result of that examination any evidence of faults or other hydrologic connections between the injection zone and any other ground source of drinking water?

A. Yes, I've reviewed that and I've found no indication of that.

Q. Mr. Cate, in your opinion will approval of this Application and the implementation of this pilot waterflood project in the North Red Hills Unit area be in the best interests of conservation, the prevention of waste and the protection of correlative rights?

A. Yes, it will.

Q. Were Exhibits 6 through 13 prepared by you or compiled at your direction?

A. Yes, they were.

MR. CARR: Mr. Stogner, at this time we would move the admission into evidence of EOG Exhibits 6 through 13.

EXAMINER STOGNER: Exhibits 6 through 13 will be admitted into evidence at this time.

MR. CARR: And that concludes my direct examination of Mr. Cate.

EXAMINATION

BY EXAMINER STOGNER:

Q. Mr. Cate, referring back to Exhibit Number 10, since this is where your production data is, you said the current production from these 39 wells is about 1600 barrels per day?

A. Yes.

Q. What is the average well daily rate?

A. Average well daily rate is approximately 40 barrels per day.

Q. Now, you're seeking a waterflood project. Does this qualify as a waterflood project for production from a pool that has that rate of production?

A. I'm not sure.

EXAMINER STOGNER: Do you have a rulebook with you, Mr. Carr?

MR. CARR: I don't have one with me, Mr. Stogner.

Q. (By Examiner Stogner) First of all, what's a stripper well?

A. Ten barrels per day or less.

Q. Okay, and what's the definition between a

pressure maintenance project and a waterflood project?

A. Pressure maintenance project, from what I understand, occurs prior to reaching the bubble point on the reservoir. That may not be what the -- I don't know if that's what the rule exactly says, but the engineering tech did contact this office to find out if it was -- how we should classify this project, and our understanding was to call it pressure maintenance since it was going to be injecting to maintain the pressure above the bubble point.

Q. Okay, so you were told to classify it as a pressure maintenance, but you're classifying -- you're advertising it as a waterflood? Am I seeing something wrong here?

A. No, it really is a pressure maintenance --

Q. Oh, okay.

A. -- project. I guess the waterflood is not a correct term.

Q. Okay, what about a project allowable? How are we going to establish that once injection starts?

A. Well, in the pilot -- You mean just for the pilot, or for the full scale?

Q. Well, you tell me. Since you brought it up, why don't you tell me how both are going to be?

A. For the pilot we believe that the current daily allowables of the offset producers are sufficient. I

believe that per 80 acres, those allowables are 660 barrels per day under the special field rules that are currently existing. And that should be more than plenty to handle any waterflood response on the pilot.

Now, we will come back or refile for the expanded waterflood at such time we're ready to implement that. Frankly, it will be two to three years before we're ready to do that, because we have to get the horizontal program accomplished and re-engineer it, and then we'll be ready to go. But at that point, if we do need increased allowable we'll, you know, ask for it at that time.

Q. Okay. Exhibit Number 7, you're showing here the proposed seven horizontals with two optionals. Now, is it EOG's intent to maintain these as producers if successful, or will they complete a couple of these or several of these as injectors?

A. Initially, they would all be producers.

Q. Okay.

A. And we would draw the reservoir pressure down to a point, and then at the time that we're ready to go with the full scale, then we'd most likely convert these horizontal wells and several of the vertical wells to injectors.

Q. Okay. Now, how are these horizontals going to be drilled?

A. They'll be drilled, of course, vertical down to approximately 11,800 feet. We'll do a medium radius that will -- We're going to target approximately 8900 feet subsea, which should keep us in most of the pay, so we'll do a medium radius, which is approximately a 400-foot radius, starting at 11,800 feet, put us into the pay at approximately 12,200 feet, drill a 4000-foot lateral, case it and most likely stimulate with a fracture treatment, a sand fracture treatment.

Q. Okay, will that casing -- Is that going to be cemented, or is it going to be a pre-perforated casing?

A. I think we'll probably end up cementing. Our research shows that you can get a lot better control of where your treatments go if you spend the extra money and just cement the casing in place.

Q. Okay, now, how about the stimulation of these horizontal wells? Will they be fractures or anything?

A. Yes, I think that our model shows that we're probably going to have to do a sand frac, somewhere around a 500,000 gallon treatment, and possibly up to a million pounds of sand.

Q. I'm assuming your first one is going to be the Number 11 well?

A. That's correct.

Q. Let's talk about the type log. And at this point

Exhibit Number 3 shows that the type log for the unitized formation would be the Hallwood 12 Well Number 6, and I believe that shows up on a subsequent exhibit; is that correct?

A. Yes, on Exhibit Number 8, which is the cross-section A-A'.

Q. Let's talk about that well for a little bit. When you refer to Exhibit Number 8, you show the top of the third Bone Spring and the top of the Wolfcamp. Does that correspond with your unitized formation description?

A. Yes, it does.

Q. Does the Bone Spring in this general area -- is it confined just to this third Bone Spring, or are any of the other upper Bone Springs intervals productive?

A. There are other producers in -- I think it's called the Triste Draw field. I think that's a first Bone Spring. But it's about three or four miles away.

Within this outline and within this immediate area, there is no other Bone Spring productive.

Q. How about -- Has there been some tests that you know of, or have shown?

A. No, we pretty much go off our mudlogs, and I just don't believe that within the unit outline there will be any other Bone Spring that will be considered productive.

Q. And you understand also that production from this

Bone Springs is going to tie up all of the Bone Springs, since all the Bone Springs is recognized as a pool?

A. Yes.

Q. Okay, your Exhibit Number 11, which is the C-108, you show tops of cement on the wells here. How was that determined? Calculation or through a temperature log?

A. We run temperature logs and cement bond logs out there.

Q. Okay. Now, did I understand you right to say that the injection interval, you're not going to have any new perforations, you're going to use the current perfs?

A. We're going to use the current perforations.

Q. Okay, what's going to be first, the horizontal drilling or the injection well?

A. Probably one or two of the horizontals. We do have some work to do on our system out there, the injection system. But I anticipate possibly up to three months, we might be ready to inject. And actually, the horizontal could possibly go as soon as 30 days. I think that well is permitted, permit is approved. So we might actually spud the first horizontal before we start the pilot.

Q. Okay now, you're referring to the permit for the horizontal on the Number 11?

A. Yes, yes.

Q. Okay, what's the proposed bottomhole location or

the end of this horizontal as you say you have it approved?

A. Well, I don't have a copy of the actual bottomhole, but when we were dealing with that permit we actually, I think, cut this one short to stop legally, 330 feet from the state land acreage for that permit. But we're not going to spud it until we do receive unit approval.

So even though it's permitted, we'll just have to file a sundry notice with the BLM to go ahead and get that whole 4000 feet. Is that -- I think that -- Isn't that right, Larry?

MR. CUNNINGHAM: (Nods)

THE WITNESS: So the current bottomhole ending location, or the lateral, will stop short of the state lands as permitted right now, but our plan would be, once we receive the unit approval from the OCD and state lands and all, that we'll sundry notice that and then extend the length to go ahead into the state lands.

Q. (By Examiner Stogner) I'm glad to hear that. I thought there was a problem with our permitting process in these horizontals if they took in a federal and a state lease without first having some sort of consolidation. Thanks for straightening me up on that. Of course it was not the intent when Rule 111, as you know, was put together.

A. Yes, we understand.

Q. Thanks for straightening me out on that. That's a relief to hear that there's not a problem with that permitting process.

What is the current disposal method on the waters coming off of these wells?

A. We have an approved disposal well -- it's the Vaca 30 -- and it would be, I guess -- well, the Pitchfork Ranch field, which is Morrow, and it's off to the northeast. There's approximately 30 wells over there too. The Vaca 30 is our disposal well in the area, and I think it's actually in the township to the east in Section 30.

We do have a system out here that currently takes the water and disposes into our own disposal well.

Q. What's your current water production from these 39 wells out there?

A. It averages between 200 and 300 barrels per day.

Q. So initially this pilot project is going to take just a very small percentage; is that correct?

A. Probably -- Well, probably 200 barrels a day, that's what we're hoping to get in the ground. It's pretty tight rock.

Q. What are you expecting to see with your horizontal well? Do you expect to see a decrease in the water production with these horizontals, or are they going

to stay proportionately the same as your vertical?

A. We'd anticipate proportionately the same, based on the fact that we will stimulate it with a fracture treatment that will basically cause all the pay to be open to the wellbore.

Q. Are you modeling the horizontals off of some other horizontals in the Bone Springs? Has that been successfully done out there very much?

A. No. As a matter of fact, this is one of only two third Bone Springs sands that we can find that's overpressured. The James Ranch has some -- That's in Eddy County, James Ranch, Los Medanos field. But it's scattered production, and it's not near the quality of reserves that this is. And then down south in the Warwink field of Texas, they've got some third Bone Spring.

But nobody has done the horizontal project out here, and this is primarily off of our modeling predictions.

Q. When was this pool discovered?

A. It was a recompletion of the Vaca 13 Number 1. I believe it was November, 1993. November, 1993. It might have been November, 1992, but I'm pretty certain it's --

Q. So most of these wells are early 1990s vintage?

A. Oh yes, yes. We haven't drilled out here for several years now.

Q. 5-1/2-inch casing tied back into the intermediate, as far as the cement goes?

A. Yes, it is.

Q. What is the current pressure of the reservoir out there now?

A. Approximately 5100 pounds.

Q. Now, is that an average throughout the pool, or what do you think? Do you think it might be a little lower there where your pilot is, since that was the first wells that were drilled?

A. I'm sorry, I was going back over these schematics, and it does appear that a couple of the wells don't have cement tied all the way back to the intermediate.

Q. Okay, let's go back to that topic. Which ones were you referring to?

A. Well, for instance, page 8, the Vaca 13 Number 4. It does not -- It appears that our top of cement is at 5500 feet versus the intermediate set at 5053. So I wanted to correct that statement I made earlier.

Q. But well back up the hole?

A. Yes, yes, it is. And again, you know, the freshwater sands are up at 600 feet and above, and they are behind two strings of pipe that circulated cement.

Q. Well, actually, I'm glad you brought that up

because I did have another question. Page 9, what happened to this wellbore? It looks like you've got a perforating gun stuck?

A. Yes, that is probably the band guns that were used to shoot, and I imagine that it was just dropped. Probably something that could be fished. But at this point it's not a detriment to producing the well or anything like that.

Q. Were you involved with the initial production or drilling of these wells out here?

A. Yes. Yes, I've been the reservoir engineer the entire life of this field.

EXAMINER STOGNER: I can't think of anything further at this time.

Anything else of this witness?

MR. CARR: (Shakes head)

EXAMINER STOGNER: Okay, you may be excused.

MR. CARR: Mr. Stogner, that concludes our presentation in this case.

EXAMINER STOGNER: Okay, Mr. Carr, if you could provide me a copy, like I stated earlier, of the corrected --

MR. CARR: -- page 6.

EXAMINER STOGNER: -- page in the unit agreement.

MR. CARR: And we will submit to you as soon as

we receive them the final letters from the BLM/State Land Office. We thought we had them today, and we may have them today, but we'll get them to you as soon as we receive them.

EXAMINER STOGNER: Since there's nothing further in Cases 12,399 and/or 12,329, then this matter will be taken under advisement.

MR. CARR: Thank you.

(Thereupon, these proceedings were concluded at 9:19 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. _____, heard by me on _____ 19____.

_____, Examiner
Oil Conservation Division

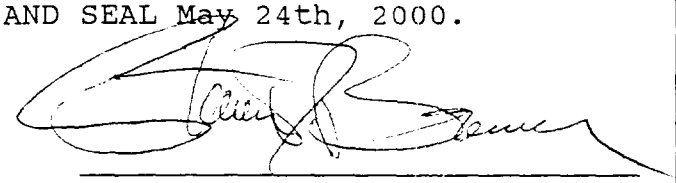
CERTIFICATE OF REPORTER

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

I, Steven T. Brenner, Certified Court Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I transcribed my notes; and that the foregoing is a true and accurate record of the proceedings.

I FURTHER CERTIFY that I am not a relative or employee of any of the parties or attorneys involved in this matter and that I have no personal interest in the final disposition of this matter.

WITNESS MY HAND AND SEAL ~~May~~ 24th, 2000.



STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 2002